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GB 2182895 A GB 0332755 A US 5133224 A
US 4323283 A

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INT CL[6] B62K 21/12 21/14 21/16 21/18 21/20 21/22 21/24
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(54) Braced, adjustable handlebars

(57) A handlebar 101 for steering a vehicle (not shown) has a medial "U"-shaped portion 103 having a pair of limbs 109 connected by base 105, which is gripped by a headstock 107 attached to the vehicle. A cross-bar 115 is clamped to free ends of said "U"-shaped portion, so as to stiffen it. Limbs 109 of the "U"-shaped portion may be movable with respect to each other on the base 105, to allow adjustment of the flexibility of the cross-bar. Fig. 1 shows a simpler embodiment. Cross-bars 113 or 115 may be angularly adjusted relative to the "U"-shaped portion. The cross-bars may be made of alloy, while the "U"-shaped portion is made of steel, or of cast alloy. Hand grip portions 17 may be integral with the cross-bar. The crossbar may be of ovoid cr ss-section.

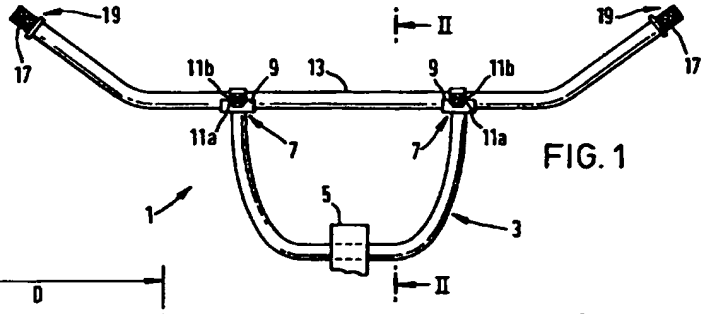

FIG. 1

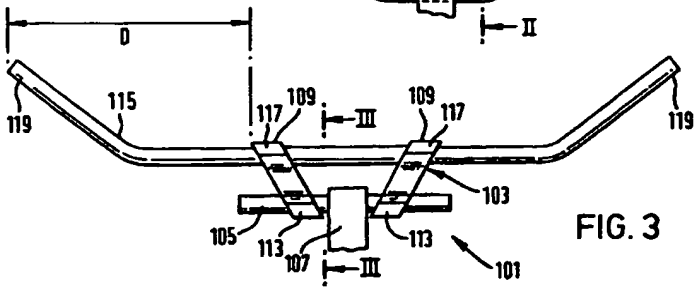

FIG. 3

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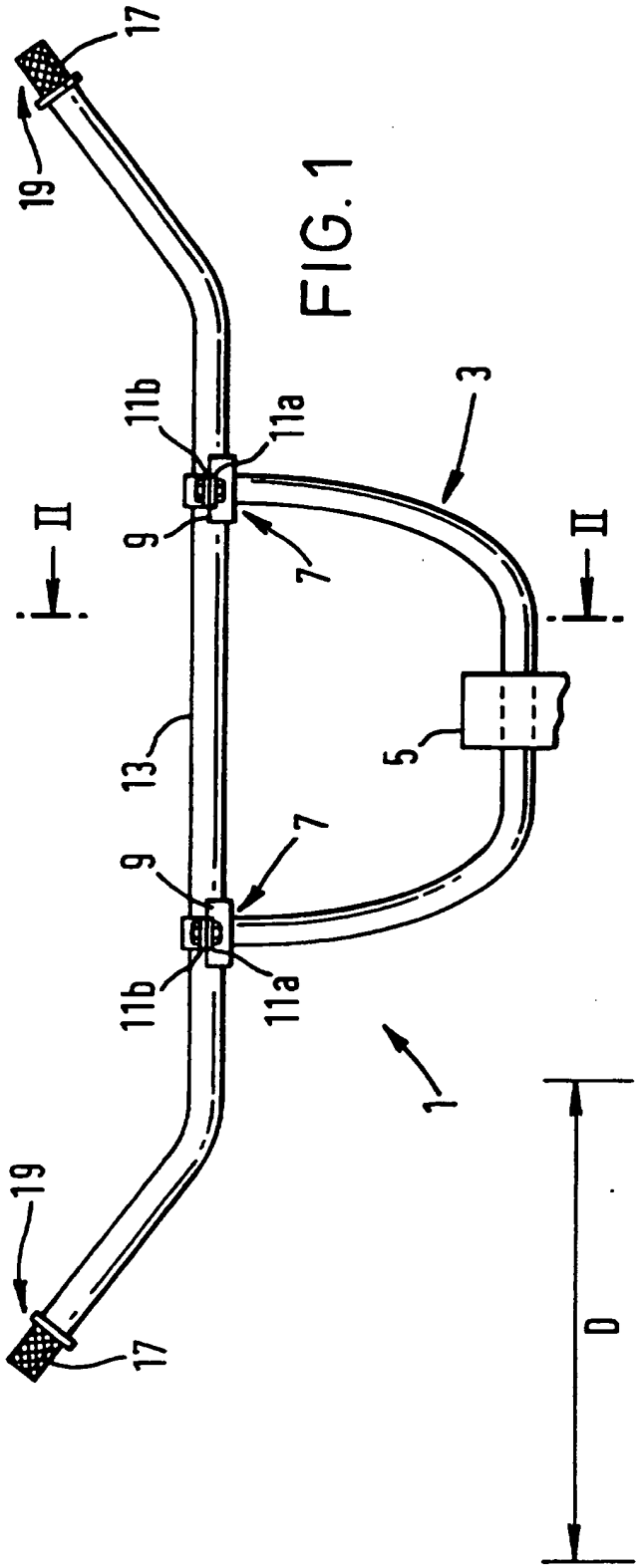
17
19
11b
11a
3
II
9
7
13
5
1
D

FIG. 1

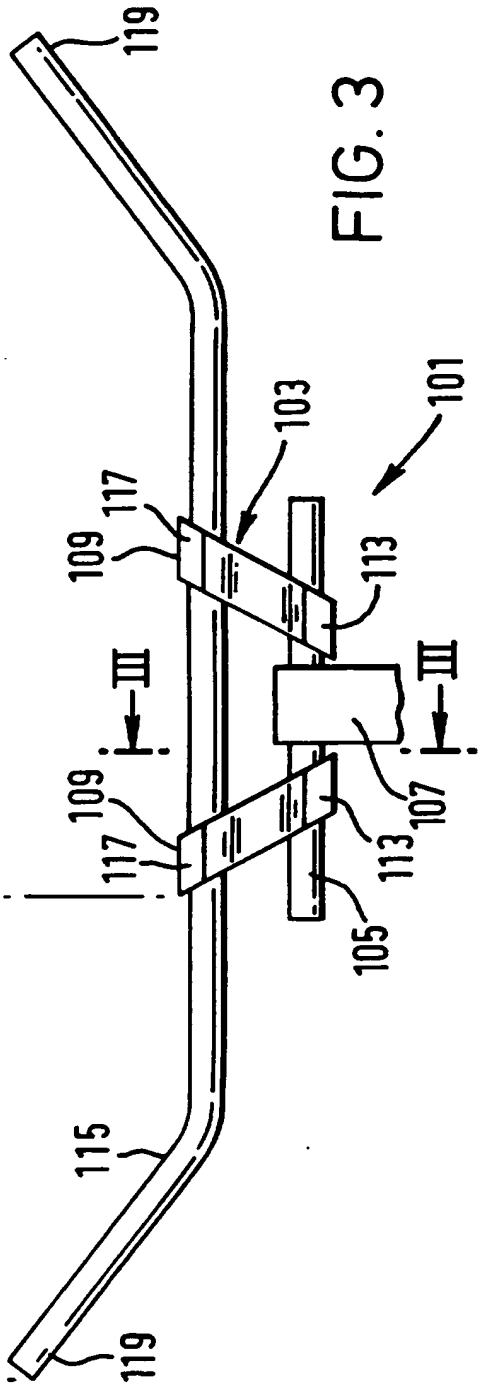
119
103
101
117
109
113
III
107
105
115

FIG. 3

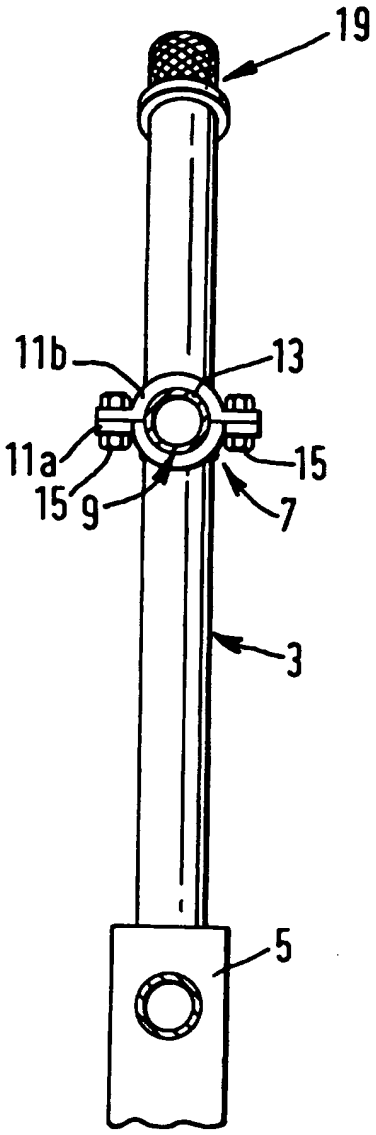

FIG. 2

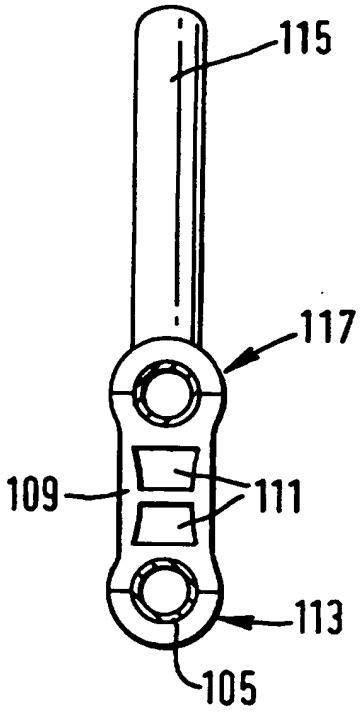

FIG. 4

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Improvements in or relating to handlebars

The present invention relates to a handlebar for steering a vehicle.

Conventionally, a prime consideration in the design of a vehicle for use in motor sport and particular in motorcycling, has been the aim of weight reduction. Traditional engineering materials such as steel have been replaced by lightweight alloys using aluminium wherever possible. Disadvantageously, the mechanical properties of many alloys are inferior to those of steel.

Consequently, in the case of a handlebar formed of lightweight tubular alloy, it has been found necessary to provide additional stiffening. Unfortunately, aluminium alloys in particular. cannot be welded effectively. As a result, the solution adopted in the prior art has been to clamp a stiffening tie-rod between the rising limbs of the "U"-shaped medial portion of the handlebar which is gripped by a central headstock. The resulting handlebar is not only unappealing to the eye, but is prone to irreparable damage through bending due to a collision or the like.

It is an object of the present invention to provide an improved handlebar which overcomes the problems of the prior art in that it has a suitable combination of flexibility and stiffness, is tougher and provides a range of adjustments to suit a particular rider.

According to the present invention there is provided a handlebar for steering a vehicle including a medial "U"-shaped portion having a pair of limbs interconnected by a base intended, in use, to be gripped by a headstock of said vehicle, a pair of hand-grip portions each extending generally away from said headstock-gripping portion, each

said hand-grip portion being form d at a respective end of a cross-bar clamped to free ends of said "U"-shaped" portion, the arrangement being such that said cross-bar stiffens the "U"-shaped portion.

Preferably, the cross-bar is angularly adjustable to compensate for the gripped position of the "U"-shaped portion in the headstock. Conveniently, the cross-bar is formed of a tubular lightweight alloy.

Again preferably, the "U"-shaped portion is formed of a lightweight steel, the free ends of which are adapted to receive the cross-bar on a clamping surface welded thereto. Alternatively, the "U-shaped" portion is made of cast alloy incorporating a clamping surface at each free end.

Still preferably, the hand-grip portions are formed integrally with said cross-bar.

In the prior art, four bends are necessary in the cross-bar to compensate for the single degree of freedom provided by the headstock. Advantageously, the cross-bar may be formed with just two bends sufficient to define turned-up hand-grip portions, as the angularly adjustable cross-bar obviates the need for further strength reducing bends. Furthermore, the removable nature of the cross-bar facilitates its simple replacement in the event of damage sustained in an accident.

According to a further preferred feature of the invention, the limbs of the medial "U"-shaped portion are axially movable with respect to each other on the base of said "U"-shaped portion.

Still preferably, th limbs diverge from said base in order to enhance the flexibility of said "U"-shaped portion.

Again preferably, the limbs are fenestrated or otherwise reduced in weight whilst maintaining their strength and stiffness.

Conveniently, the cross-bar may be formed of tubing of a non-circular or variable cross-section and hence could be ovoid to provide different flexibility depending on the direction of the applied force, whilst the base tubing could be polygonal to provide a set of discrete fore and aft positions of a suitably adapted limb.

Advantageously, the base might be formed with a headstock as an integral part thereof.

In order to aid in understanding the invention specific embodiments thereof will now be described by way of example and with reference to the accompanying drawings, in which:

Figure 1 is a front view of a handlebar according to the invention shown gripped by a headstock;

Figure 2 is a cross-sectional side view on the line II-II of the handlebar of Figure 1;

Figure 3 is a front view of a handlebar according to a further embodiment of the invention shown gripped by a headstock; and

Figure 4 is a cross-sectional side view on the line III-III of the handlebar of Figure 3.

The handlebar 1 shown in Figures 1 and 2, includes a "U"-shaped portion 3 of hollow steel tubing which is gripped, in use, by a headstock 5, which facilitates,

through rotation of said "U"-shaped portion 3, fore and aft adjustment of the handlebar 1. The "U"-shaped portion 3 is provided with spaced apart axially parallel grooves (not shown) in its circumference in the vicinity of the headstock to enhance grip.

Each free end 7 of the "U"-shaped portion 3 supports and is welded to a clamping surface 9, which incorporates a lower clamp element 11a. The clamping surface 9 is semi-cylindrical and sized to accommodate a tubular alloy cross-bar 13.

The cross-bar 13 is similarly provided with spaced apart axially parallel grooves (not shown) to enhance the clamping action provided by an upper clamp element 11b which is secured by bolts 15 to the lower element 11a and thus to connect the cross-bar 13 to the "U"-shaped portion 3.

The cross-bar 13 incorporates a turned-up hand-grip and throttle-grip portion 17 at respective free ends 19, and in use, it is possible by slackening the bolts 15 to utilise the additional degree of freedom provided by the clamping surface 11. Hence, the inclination of the hand-grip portion 17 may be adjusted to compensate for the selected position of the "U"-shaped portion 3 gripped by the headstock 5. In this way a rider may obtain a more comfortable riding position than possible with hitherto known handlebars.

Referring now to the further embodiment shown in Figures 3 and 4; the handlebar 101 includes a "U"-shaped element 103 comprising a base portion 105 of tubular lightweight steel or other suitable alloy, which is gripped, in use, by a h adstock 107, and a pair of fenestrated 111 limbs 109, each attached via a lower clamp

113 to said base 105 and ach limb 109 being connectable to a tubular alloy cross-bar 115 via upp r an upper clamp 117.

Adjustment of the flexibility of the crossbar 115 to suit a particular rider is made possible by varying the separation of the limbs 109 to alter the distance D between the upper clamp 117 of each limb 109 and a respective free end 119 of the cross bar 115. This is achieved, in use, by slackening the upper and lower clamps 113,117 and positioning the limbs 109 at different axial positions on the base 105, and correspondingly the crossbar 115. Adjustment is made easier by the provision of a set of index marks (not shown) on said base 105 to enable precise adjustment of the axial position of each limb 109.

It will be clear to one skilled in the art that the invention is not limited to the above embodiments. For instance, in the case of the first embodiment, the "U"-shaped portion 3 could be cast as a single piece including the clamping surface 9 and/or the lower clamp element 11a, in which case it might be formed from an aluminium alloy or other suitable material such as a carbon fibre containing composite or the like, for example. In general, the clamps could be replaced by any suitable arrangement well known to one skilled in the art such as, for instance, a splined connection. Furthermore, in order to provide flexibility without compromising strength the cross-bar could be formed of tubing of a non-circular, or variable, or indeed tapering cross-section, and hence could be ovoid to provide different flexibility depending on the direction of the applied force.

Claims:

1. A handlebar for steering a vehicle including a medial "U"-shaped portion having a pair of limbs interconnected by a base intended, in use, to be gripped by a headstock of said vehicle, a pair of hand-grip portions each extending generally away from said headstock-gripped portion, each hand-grip portion being formed as an extension of a cross-bar clamped to free ends of said "U"-shaped" portion, the arrangement being such that said cross-bar stiffens the "U"-shaped portion.

2. A handlebar as claimed in Claim 1, in which the cross-bar is angularly adjustable to compensate for the position of the "U"-shaped portion in the headstock.

3. A handlebar as claimed in Claim 1 or 2, in which the cross-bar is formed of a tubular lightweight alloy.

4. A handlebar as claimed in any preceding Claim, in which the "U"-shaped portion is formed of a lightweight steel, the free ends of which are adapted to receive the cross-bar on a clamping surface welded thereto.

5, A handlebar as claimed in Claims 1 to 3, in which the "U-shaped" portion is made of cast alloy incorporating a clamping surface at each free end.

6. A handlebar as claimed in any preceding Claim, in which the hand-grip portions are formed integrally with said cross-bar.

7. A handlebar as claimed in any preceding Claim, in which the cross-bar is formed with just two bends sufficient to define turned-up hand-grip portions, as the

angularly adjustable cross-bar obviates the need for further strength reducing bends.

8. A handlebar as claimed in any preceding Claim, in which the cross-bar is removable to facilitate simple replacement thereof.

9. A handlebar as claimed in any preceding Claim, in which the limbs of the medial "U"-shaped portion are axially movable with respect to each other on the base of said "U"-shaped portion.

10. A handlebar as claimed in any preceding Claim, in which the limbs diverge from said base in order to enhance the flexibility of said "U"-shaped portion.

11. A handlebar as claimed in any preceding Claim, in which the limbs are fenestrated or otherwise reduced in weight whilst maintaining their strength and stiffness.

12. A handlebar as claimed in any preceding Claim, formed from variable cross-section tubing.

13. A handlebar as claimed in any preceding Claim, formed from non-circular cross-section tubing.

14. A handlebar as claimed in any preceding Claim, which the cross-bar is formed from tubing having an ovoid cross-section to provide different flexibility depending on the direction of the applied force.

15. A handlebar as claimed in Claim 9 and any Claim appendant thereto, in which the base of the "U"-shaped portion is formed from tubing of polygonal cross-section to provide a set of discrete fore and aft positions of a suitably adapted limb.

16. A handlebar as claimed in any preceding Claim, in which the base might be formed with a headstock as an integral part thereof.

17. A handlebar substantially as hereinbefore described with reference to Figures 1 and 2 of the accompanying drawings.

18. A handlebar substantially as hereinbefore described with reference to Figures 3 and 4 of the accompanying drawings.

19. The features herein described or illustrated, or their equivalents, in any patentably novel selection.

Patents Act 1977 9 Examiner's rep rt to the Comptroller under Secti n 17 (The Search report)	Application number GB 9520095.2
Relevant Technical Fields (i) UK Cl (Ed.N) B7E (ESA, ESB, ESC, ESR, ESS) (ii) Int Cl (Ed.6) B62K (21/12, 21/14, 21/16, 21/18, 21/20, 21/22, 21/24)	Search Examiner K STRACHAN Date of completion of Search 5 DECEMBER 1995
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii) ONLINE: WPI	Documents considered relevant following a search in respect of Claims :- 1 TO 16

Categories of documents

X:	Document indicating lack of novelty or of inventive step.	P:	Document published on or after the declared priority date but before the filing date of the present application.
Y:	Document indicating lack of inventive step if combined with one or more other documents of the same category.	E:	Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A:	Document indicating technological background and/or state of the art.	&:	Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2182895 A	(MOULTON) see Figures notice limbs 101, 102, base 111, 112, steering column 17, hand grips/cross bar 12	1, 2, 4, 8, 10, 11, 16 at least
X	GB 332755	(TRIUMPH) see Figure 2; notice limbs 21, base 24, headstock 18, cross bar 11	1, 2, 8, 10, 11 at least
X	US 5133224	(PRINS) see Figure 1; notice U-shaped portion 15, headstock 12, cross bar 22, 24	1, 2, 8, 10, 11, 16 at least
X	US 4323263	(COOK) see Figures 1 and 2; notice U-shaped portion 32, headstock 18, cross bar 44	1, 2, 8, 11, 16 at least

Databases:The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).